

TENT COOPERATION TREATY

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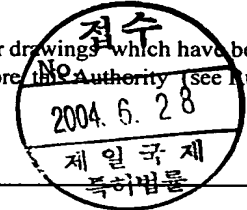
INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PCA20419/PSC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/KR2002/000925	International filing date (day/month/year) 17 MAY 2002 (17.05.2002)	Priority date (day/month/year) 14 MARCH 2002 (14.03.2002)
International Patent Classification (IPC) or national classification and IPC IPC7 C07F 15/00		
Applicant POSTECH FOUNDATION et al		



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before the Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.



3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 24 SEPTEMBER 2003 (24.09.2003)	Date of completion of this report 21 JUNE 2004 (21.06.2004)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer SHIN, Gun Il  Telephone No. 82-42-481-5543

1. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet _____

5.

- ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1-11	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-11	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-11	YES
	Claims	None	NO

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: Jose A. et al., "Proton Transfer in Aminocyclopentadienyl Ruthenium Hydride Complexes, Organometallics" , 1999, 18, pages 3981-3990

D2: Fernando F. et al., "Dynamic Kinetic Resolution of α -Hydroxy Acid Esters", Organic Letters, 2000, 2(8), pages 1037-1040

D3: Nakazawa Hiroshi, "Studies on Compounds Containing a New Type of Bond between a Transition-Metal and a Phosphorus" , Ashahi Garasu Zaidan Josei Kenkyu Seika Hokoku, 1994, pages 141-147

D4: Daran, Jean Claude et al., "Coupling of 1-(diethylamino) propyne on dodecacarbonyltriiron and dodecacarbonyltriruthenium" , Organometallics, 1984, 3(8), pages 1158-1163

The present application relates to aminocyclopentadienyl ruthenium complexes useful as a catalyst in the racemization of a chiral compound, and the preparation thereof.

D1 discloses aminocyclopentadienyl ruthenium hydride complexes which have cyclopentadienyl ligands accommodating linear amino groups such as $C_5H_4CH_2CH_2NMe_2$ or $C_5H_4CH_2CH_2CH_2NMe_2$, and the protonation of hydrides. D2 discloses diruthenium complexes such as $[(p\text{-cymene})RuCl_2]_2$ and $(\eta^5\text{-Ph}_4C_4CO)_2H(\mu\text{-H})(CO)_4Ru_2$, and enzymatic dynamic kinetic resolution in combination with ruthenium-catalyzed racemization of the substrate. D3 discloses Ru phosphonate complexes with a covalent bond between Ru and pentavalent phosphorus. D4 discloses ruthenium carbonyl complex $[Ru_4(CO)_8C_5OMe_2(NEt_2)_2]_2$, containing a cyclopentadienone with head-to-tail coupling.

(Continued on Supplemental Sheet.)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2002/000925

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of:

Box V.

The subject matter of the present application differs from the disclosure of D1 to D4 mainly in that the present application provides aminocyclopentadienyl ruthenium complexes which can racemize a chiral secondary alcohol rapidly at room temperature in the absence of a hydrogen-transfer agent. Although D2 discloses ruthenium complexes useful as a racemization catalyst, the complexes of D2 do not have the amino group bonded to cyclopentadienyl ligands and need hydrogen mediators for the racemization. D1 and D4 disclose aminocyclopentadienyl ruthenium complexes, but neither of the documents D1 and D4 teach or fairly suggest such aminocyclopentadienyl ruthenium complexes which can racemize a chiral secondary alcohol rapidly at room temperature in the absence of a hydrogen-transfer agent as disclosed in the present application. Accordingly, it cannot be considered obvious to a person skilled in the art to configure such aminocyclopentadienyl ruthenium complexes as disclosed in the present application in order to solve the problem posed, with knowledge of the cited documents.

Therefore, the subject matter of the present invention are considered to meet the requirements of Article 33(2) and 33(3) PCT.